

**THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

Applicant: Peter Neumann
Appl. No.: 10/511,457
Conf. No.: 9884
Filed: October 15, 2004
Title: DISASTER AND EMERGENCY MODE FOR MOBILE RADIO PHONES
Art Unit: 2617
Examiner: Kiet M. Doan
Docket No.: 119065-64

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

APPELLANTS' APPEAL BRIEF

Sir:

Appellants submit this Appeal Brief in support of the Notice of Appeal filed on December 1, 2009. This Appeal is taken from the Final Rejection in the Office Action dated September 1, 2009.

I. REAL PARTIES IN INTEREST

The real parties in interest for the above-identified patent application on Appeal is Palm, Inc., by virtue of an Assignment recorded on September 28, 2007 at reel/frame 019897/0912 in the United States Patent and Trademark Office.

II. RELATED APPEALS AND INTERFERENCES

Appellant's legal representative and the Assignees of the this patent application do not know of any prior or pending appeals, interferences or judicial proceedings that may be related to, directly affect or be directly affected by or have a bearing on the Board's decision with respect to the above-identified Appeal.

III. STATUS OF CLAIMS

Claims 9-16 are pending in this application. Claims 1-8 were previously canceled. Claims 9-16 stand rejected. Therefore, Claims 9-16 (with claims 9 and 16 in independent form) are being appealed in this Brief. A copy of the appealed claims is included in the Claims Appendix.

IV. STATUS OF AMENDMENTS

A final Office Action was mailed on September 1, 2009. Applicants filed a Notice of Appeal on December 1, 2009. A copy of the final Office Action is attached as Exhibit A.

V. SUMMARY OF CLAIMED SUBJECT MATTER

A summary of the claimed subject matter by way of reference to the specification and/or figures for each of the independent claims is provided as follows:

Independent Claim 9 is directed to a method for controlling establishment of connections to mobile stations (FIG. 1 elements 5 and 6) present in an area (FIG. 1 element 7), the method comprising: transmitting a sequence (FIG. 1 element 4) in a message sent to the mobile stations (FIG. 1 elements 5 and 6) in at least one cell of a mobile radio network present in the area (FIG. 1 element 7); and providing that a connection only be established from a mobile station (FIG. 1 elements 5 and 6) in the area (FIG. 1 element 7) to a destination called by the mobile station (FIG. 1 elements 5 and 6) if the mobile station (FIG. 1 elements 5 and 6) requesting the connection establishment communicates the sequence (FIG. 1 element 4).

Independent Claim 16 is directed to a switching device (FIG. 1 element 2) for controlling establishment of a connection to mobile stations (FIG. 1 elements 5 and 6) present in an area (FIG. 1 element 7), comprising: a transmitting apparatus for transmitting a sequence (FIG. 1 element 4) in a message sent to the mobile stations (FIG. 1 elements 5 and 6) in at least one cell of a mobile radio network present in the area (FIG. 1 element 7); and a receiving apparatus sequence (FIG. 1 element 9) for receiving the sequence (FIG. 1 element 4) with a request for establishment of a connection to a destination from a mobile station (FIG. 1 elements 5 and 6) in the area (FIG. 1 element 7), wherein the connection requested from the mobile station (FIG. 1 elements 5 and 6) will be established to the destination, only if the mobile station (FIG. 1 elements 5 and 6) can specify the sequence (FIG. 1 element 4) and the destination is a destination provided for call establishment.

Although citations are given in accordance with 37 C.F.R. §1.192(c), these reference numerals and citations are merely examples of support in the specification for the terms used in this section of the Brief. There is no intention to suggest in any way that the terms of the claims are limited to the examples in the specification. As demonstrated by the references numerals and citations, the claims are fully supported by the specification as required by law. However, it is improper under the law to read limitations from the specification into the claims. Pointing out specification support for the claim terminology in accordance with Rule 1.192(c) does not in any way limit the scope of the claims to those examples from which they find support. Nor does this

exercise provide a mechanism for circumventing the law precluding reading limitations into the claims from the specification. In short, the references numerals and specification citations are not to be construed as claim limitations or in any way used to limit the scope of the claims.

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Claims 9-16 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,161,016 to Yarwood ("*Yarwood*") in view of U.S. Application No. 2002/0019241 to Vialen et al. ("*Vialen*"). Copies of *Yarwood* and *Vialen* are attached hereto as Exhibits B and C, respectively, in the Evidence Appendix.

VII. ARGUMENT

A. LEGAL STANDARDS

1. Obviousness under 35 U.S.C. §103

The Federal Circuit has held that the legal basis for a determination of obviousness under 35 U.S.C. § 103 is:

whether the claimed invention as a whole would have been obvious to a person of ordinary skill in the art at the time the invention was made...The foundational facts for the *prima facie* case of obviousness are: (1) the scope and content of the prior art; (2) the difference between the prior art and the claimed invention; and (3) the level of ordinary skill in the art...Moreover, objective indicia such as commercial success and long felt need are relevant to the determination of obviousness...Thus, each obviousness determination rests on its own facts.

In re Mayne, 41 U.S.P.Q. 2d 1451, 1453 (Fed. Cir. 1997).

In making this determination, the Examiner has the initial burden of proving a *prima facie* case of obviousness. *In re Rijckaert*, 9 F.3d 1531, 1532, 28 U.S.P.Q. 2d 1955, 1956 (Fed. Cir. 1993). This burden may only be overcome “by showing some objective teaching in the prior art or that knowledge generally available to one of ordinary skill in the art would lead that individual to combine the relevant teachings.” *In re Fine*, 837 F.2d 1071, 1074, 5 U.S.P.Q. 2d 1596, 1598 (Fed. Cir. 1988). “If the examination at the initial stage does not produce a *prima facie* case of unpatentability, then without more the applicant is entitled to grant of the patent.” *In re Oetiker*, 24 U.S.P.Q. 2d 1443, 1444 (Fed. Cir. 1992).

Moreover, the Examiner must provide explicit reasons why the claimed invention is obvious in view of the prior art. The Supreme Court has emphasized that when formulating a rejection under 35 U.S.C. § 103(a) based upon a combination of prior art elements it remains necessary to identify the reason why a person of ordinary skill in the art would have combined the prior art elements in the manner claimed. *KSR v. Teleflex*, 127 S. Ct. 1727 (2007).

Of course, references must be considered as a whole and those portions teaching against or away from the claimed invention must be considered. *Bausch & Lomb, Inc. v. Barnes-Hind/Hydrocurve Inc.*, 796 F.2d 443 (Fed. Cir. 1986). “A prior art reference may be considered to teach away when a person of ordinary skill, upon reading the reference would be discouraged

from following the path set out in the reference, or would be led in a direction divergent from the path that was taken by the Applicant.” *Monarch Knitting Mach. Corp. v. Fukuhara Indus. Trading Co., Ltd.*, 139 F.3d 1009 (Fed. Cir. 1998) (quoting *In re Gurley*, 27 F.3d 551 (Fed. Cir. 1994)).

B. THE CLAIMED INVENTION

There are two independent claims on appeal: Claims 9 and 16. Independent Claim 9 is generally directed to a controlling establishment of connections to mobile stations present in an area. Independent Claim 16 is generally directed to a mobile station for controlling establishment of a connection from an area.

Claims 9-16 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,161,016 to Yarwood (“*Yarwood*”) in view of U.S. Application No. 2002/0019241 to Vialen et al. (“*Vialen*”).

C. THE REJECTION OF CLAIMS 9-16 UNDER 35 U.S.C. §103(A) SHOULD BE REVERSED BECAUSE THE EXAMINER HAS FAILED TO ESTABLISH A *PRIMA FACIE* CASE OF OBVIOUSNESS

1. Prior Art Rejections

Claims 9-16 are pending in the present application. Independent claims 9 and 16 are the focus of this request. Applicant respectfully submits, in the arguments provided below and previously made of record, that the rejections are improper and should be withdrawn.

Claims 9, 15 and 16 were rejected under 35 U.S.C. §103(a) as being unpatentable over *Yarwood* (US 6,161,016) in view of *Vialen* (US 2002/0018241). The Applicant respectfully traverses these rejections for at least the following reasons.

The cited art, alone and in combination, fails to teach or suggest the features of “transmitting a sequence in a message sent to the mobile stations...and providing that a connection only be established from a mobile station in the area to a destination called by the

mobile station if the mobile station requesting the connection establishment communicates the sequence” as recited in claim 9, and similarly recited in claims 15 and 16.

The present claims are directed to addressing the issues of mobile radio networks in an area hit by a disaster, where the networks are frequently overloaded due to users of numerous mobile stations present in the area trying to make emergency calls. To alleviate such problems, the present claims recite a configuration where a certain sequence is transmitted to certain mobile stations in at least one cell in the area of the disaster, wherein the sequence allows a mobile station to request the establishment of a connection (e.g., a voice connection) to a specified destination address only when the sequence is properly communicated by the mobile station. In other words, the sequence acts like a password in that the transmitter (e.g., base station) only sends the “secret” sequence to certain mobile stations and then requires the same sequence back from any mobile station that wants to establish a connection.

The Office action relies on *Yarwood* to teach the claimed “transmitting a sequence.” Applicant respectfully disagrees. The “paging signals” taught by *Yarwood* are merely signals to alert mobile units that a broadcast message is being sent. For example, a plurality of different mobile units on various different channels may all receive the paging signal, and in response, all of the mobile units may move to a common channel in order to receive an emergency voice message being broadcast on that channel.

In addition, as stated in the Office action, *Yarwood* is silent on the feature of establishing a connection (e.g., a voice connection) to a specified destination address only when the sequence is properly communicated by the mobile station (OA pg. 3). *Vialen* also fails to teach or suggest this feature. In *Vialen*, the only time a paging request is denied is if there is “no capacity or capability to create a bearer.” (¶42). There is absolutely no check in *Vialen* to see if the mobile station communicates a particular sequence it previously received, let alone the paging signal from *Yarwood*, which is a completely different type of message than the paging request of *Vialen*.

All other pending claims depend from 9, 15 or 16 and are allowable for at least the same reasons. Accordingly, the Applicant respectfully submits that claims 9-16 are both novel and non-obvious over the art of record.

2. The skilled artisan would not have arrive at the claimed invention in view of Yarwood and Vialen

The Examiner generally concludes that it would have been within the ordinary skill of the artisan at the time the claimed invention was made because the references relied upon allegedly teach that all aspects of the claimed invention were individually known in the art. However, this conclusory statement is not sufficient to establish a *prima facie* case of obviousness without some objective reason to utilize the teachings of the references to arrive at the invention. *Ex parte Levengood*, 28 USPQ2d 1300 (Bd. Pat. App. & Inter. 1993). There must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness by the Examiner. *In re Kahn*, 441 F.3d 977, 988, 78 USPQ2d 1329, 1336 (Fed. Cir. 2006).

There is no apparent reason why one having ordinary skill and creativity would combine *Yarwood* and *Vialen* in the manner suggested in the office action. Applicant respectfully submits that the Office Action has improperly piecemealed individual features from multiple references to arrive at the present rejection. "[A] patent composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art." KSR, 127 S. Ct. at 1732. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on Appellant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). As discussed above, *Rinne*, is directly related to handover, and teaches away from a "process that is independent of a handover" as presently claimed. Hence, modifying a process that does not use handover, with one that does, would not have been contemplated at the time of the invention. Simply reversing the primary and secondary references, as suggested above, does not overcome these issues.

The skilled artisan would not have arrived at the claimed invention using the cited references in the absence of hindsight. Moreover, *Yarwood* and *Vialen* fail to even recognize the advantages, benefits and/or properties of the present claims. Instead, Appellants respectfully submit that the Examiner is improperly using Appellants' patent application as a road map for creating hindsight obviousness. Accordingly, Appellants respectfully submit that Claims 9-16, are novel, nonobvious and distinguishable from the cited references and are in condition for allowance.

VIII. CONCLUSION

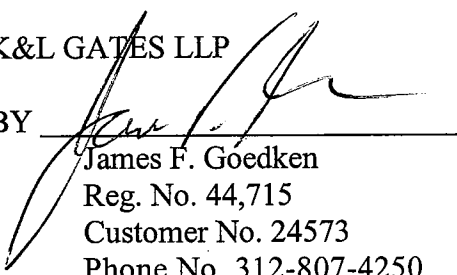
Appellants respectfully submit that the Examiner has failed to establish a *prima facie* case of obviousness under 35 U.S.C. §103 with respect to the rejection of Claims 9-16. Accordingly, Appellants respectfully submit that the obviousness rejection is erroneous in law and in fact and should therefore be reversed by this Board.

The Director is authorized to charge any fees that may be required, or to credit any overpayment to Deposit Account No. 02-1818. If such a withdrawal is made, please indicate the Attorney Docket No. 119065-62 on the account statement.

Respectfully submitted,

K&L GATES LLP

BY



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Dated: January 28, 2010

CLAIMS APPENDIX

PENDING CLAIMS ON APPEAL OF U.S. PATENT APPLICATION SERIAL NO. 10/511,457

9. A method for controlling establishment of connections to mobile stations present in an area, the method comprising:

transmitting a sequence in a message sent to the mobile stations in at least one cell of a mobile radio network present in the area; and

providing that a connection only be established from a mobile station in the area to a destination called by the mobile station if the mobile station requesting the connection establishment communicates the sequence.

10 The method for controlling establishment of connections to mobile stations as claimed in claim 9, wherein the sequence is transmitted as a cell broadcast short message.

11 The method for controlling establishment of connections of mobile stations as claimed in claim 9, wherein the sequence is transmitted as a circuit switched group call.

12 The method for controlling establishment of connections of mobile stations as claimed in claim 9, wherein the transmission of the sequence occurs via an SIM application toolkit of a mobile station, the SIM application toolkit prompting the mobile station to transmit data representing at least one of a telephone number of the mobile station and a terminal number of the mobile radio to one of the mobile radio network and a destination.

13 The method for controlling establishment of connections of mobile stations as claimed in claim 9, wherein a telephone number of a subscriber, which a mobile station may call during the disaster, consists of the sequence and at least one of at least part of a device number of the mobile station and a subscriber ID number of the mobile station..

14 The method for controlling establishment of connections of mobile stations as claimed in claim 9, further comprising scanning at least one of telephone numbers and mobile

station device numbers of the mobile stations in the area to substantially ascertain which of the mobile stations are present in the area.

15 A switching device for controlling establishment of a connection to mobile stations present in an area, comprising:

a transmitting apparatus for transmitting a sequence in a message sent to the mobile stations in at least one cell of a mobile radio network present in the area; and

a receiving apparatus for receiving the sequence with a request for establishment of a connection to a destination from a mobile station in the area, wherein the connection requested from the mobile station will be established to the destination, only if the mobile station can specify the sequence and the destination is a destination provided for call establishment.

16 A mobile station for controlling establishment of a connection from an area, comprising:

a receiving apparatus for receiving, in the area of the disaster in which the mobile station is present, a sequence, wherein the sequence is received in a message sent to the mobile station in at least one cell of a mobile radio network present in the area; and

a transmitting apparatus for transmitting the sequence with a request for establishment of a connection to a destination to the mobile radio network, wherein a connection will be established to the destination, only if the mobile station can specify the sequence and the destination is a destination provided for call establishment.

EVIDENCE APPENDIX

EXHIBIT A: Final Office Action dated September 1, 2009

EXHIBIT B: U.S. Patent No. 6,161,016 to Yarwood et al. ("*Yarwood*")

EXHIBIT C: U.S. Application No. 2002/0018241 to Vialen et al. ("*Vialen*")

RELATED PROCEEDINGS APPENDIX

None

EXHIBIT A



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/511,457	10/15/2004	Peter Neumann	119065-064	9884
29177	7590	09/01/2009		
K&L Gates LLP P.O. BOX 1135 CHICAGO, IL 60690			EXAMINER DOAN, KIET M	
			ART UNIT	PAPER NUMBER
			2617	
			MAIL DATE	DELIVERY MODE
			09/01/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/511,457	Applicant(s) NEUMANN, PETER	
	Examiner KIET DOAN	Art Unit 2617	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 June 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 9-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 9-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on _____ is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This office action is response to Applicant's remarks file one 06/12/2009.
 - No claims are amended

Response to Arguments

2. Applicant's arguments filed 06/12/2009 have been fully considered but they are not persuasive.
3. In response to applicant's argument in claim 9 that the combination of prior art does not reject claim inventive concept and further address the word "sequence" acts like password in the transmission to base station and only send the "secret" sequence to certain mobile stations and then requires the same sequence back from any mobile station wants to establish a connection.
4. The examiner respectfully disagrees and the rejection is base on claim language and broadest reasonable interpretation. The examiner interpreted the word "sequence" is repeating or the following of one thing after another or continuous or multiple responses. Therefore, the combination of Yarwood and Vialen clearly teach the recited limitation in claims 9, 15 and 16.
5. The examiner also reminds the applicant that the **recent landmark KSR** ruling puts forth that simple substitution of one known element or application for another to a piece of prior art ready for improvement is not patentable under 35 USC 103(a).

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Accordingly, the claims are viewed as a combination that only unites elements with no change in respective functions of those elements and said combination yields predictable results.

Absent evidence that the modifications necessary to effect the combination of elements is uniquely challenging or difficult for one of ordinary skill the claims are also deemed unpatentable.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. **Claims 9, and 12-16** are rejected under 35 U.S.C. 103(a) as being unpatentable over Yarwood (US 6,161,016) in view of Vialen et al. (US 2002/0019241 A1).

Consider **claim 9, 15 and 16**. Yarwood teaches a method for controlling establishment of connections to mobile stations present in an area of a disaster (Abstract, Paragraph [0024] teach provide connection in an event of emergency overload), the method comprising:

transmitting a sequence in a message sent to the mobile stations in at least one cell of a mobile radio network present in the area (Abstract, Col.3, lines 8-15 teach

repeating transmitting/paging signal periodically to mobile device). Yarwood teaches the claimed limitation as discussed above **but is silent on**

providing that a connection only be established from a mobile station in the area to a destination called by the mobile station if the mobile station requesting the connection establishment communicates the sequence.

In an analogous art, **Vialen teaches** providing that a connection only be established from a mobile station in the area to a destination called by the mobile station if the mobile station requesting the connection establishment communicates the sequence (Abstract, Paragraphs [0018-0020], [0041-0042], [0050] teach mobile requesting connection/paging message from core network and receiving multiple/multicall page message/response).

It would have been obvious at the time that the invention was made to modify Yarwood with Vialen's system, such that in an area of disaster, base station transmitting a sequence in a message sent to the mobile stations and in order to connection the mobile station establishment the sequence to provide means for the users capable transmitted or received service without interrupt or disconnect during emergency or system overload.

8. **Claims 10 and 11** are rejected under 35 U.S.C. 103(a) as being unpatentable over Yarwood (US 6,161,016) in view of Vialen et al. (US 2002/0019241 A1) and further view of Lee et al. (US 2004/0242246 A1).

Consider **claim 10**. The combination of Yarwood and Vialen teach a method for controlling establishment of connections to mobile stations as claimed in claim 9, **but is silent on** wherein the sequence is transmitted as a cell broadcast short message.

In an analogous art, **Lee teaches** wherein the sequence is transmitted as a cell broadcast short message (Abstract, Paragraphs [0006], [0031-0032]). It would have been obvious at the time that the invention was made to modify Yarwood and Vialen with Lee's system such that the sequence is transmitted as a cell broadcast short message in order to prevent overload the system and fast way to communication with mobile device during emergency.

Consider **claim 11**. The combination of Yarwood and Vialen teach the method for controlling establishment of connections of mobile station as claimed in claim 9. Further Lee teaches wherein the sequence is transmitted as a circuit switched group call (Paragraphs [0016-0017] teach plurality of mobile device 114 read as group call).

9. **Claims 12-14** are rejected under 35 U.S.C. 103 (a) as being unpatentable over Yarwood (US 6,161,016) in view of Vialen et al. (US 2002/0019241 A1) and further view of Coles et al. (US 2006/0217153 A1).

Consider **claims 12 and 13**. The combination of Yarwood and Vialen teach the method for controlling establishment of connections of mobile stations as claimed in claim 9, **but is silent on** wherein the transmission of the sequence occurs via an SIM application toolkit of a mobile station, the SIM application toolkit prompting the mobile

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station to transmit data representing at least one of a telephone number of the mobile station and a terminal number of the mobile radio to one of the mobile radio network and a destination.

In an analogous art, **Coles teaches** wherein the transmission of the sequence occurs via an SIM application toolkit of a mobile station, the SIM application toolkit prompting the mobile station to transmit data representing at least one of a telephone number of the mobile station and a terminal number of the mobile radio to one of the mobile radio network and a destination (Abstract, Paragraphs [0037-0038], [0041]). It would have been obvious at the time that the invention was made to modify Yarwood and Vialen with Coles's system such that the SIM application toolkit prompting the mobile station to transmit data representing at least one of a telephone number of the mobile station in order to secure and transmit to a correct phone/user.

Consider **claim 14**. The combination of Yarwood and Vialen teach a method for controlling establishment of connections of mobile stations as claimed in claim 9. Further, Coles teaches comprising scanning at least one of telephone numbers and mobile station device numbers of the mobile stations in the area to substantially ascertain which of the mobile stations are present in the area (Paragraphs [0020], [0034]).

Conclusion

10. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

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A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to KIET DOAN whose telephone number is (571)272-7863. The examiner can normally be reached on 8am - 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Charles Appiah can be reached on 571-272-7904. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Kiet Doan/
Examiner, Art Unit 2617

/NICK CORSARO/

Supervisory Patent Examiner, Art Unit 2617

EXHIBIT B



US006161016A

United States Patent [19]**Yarwood**[11] **Patent Number:** **6,161,016**[45] **Date of Patent:** **Dec. 12, 2000**

[54] **BROADCAST CHANNEL SEIZURE WITH
ALLOCATED SINGLE TRAFFIC CHANNEL
PER OCCUPIED CELL IN A CELLULAR
SYSTEM**

[75] Inventor: **Anthony Charles Yarwood**, Ipswich,
United Kingdom

[73] Assignee: **British Telecommunications public
limited company**, London, United
Kingdom

[21] Appl. No.: **08/553,431**

[22] PCT Filed: **May 23, 1994**

[86] PCT No.: **PCT/GB94/01123**

§ 371 Date: **Jan. 16, 1996**

§ 102(c) Date: **Jan. 16, 1996**

[87] PCT Pub. No.: **WO94/28687**

PCT Pub. Date: **Dec. 8, 1994**

Related U.S. Application Data

[63] Continuation-in-part of application No. 08/179,961, Jan. 11, 1994.

[30] Foreign Application Priority Data

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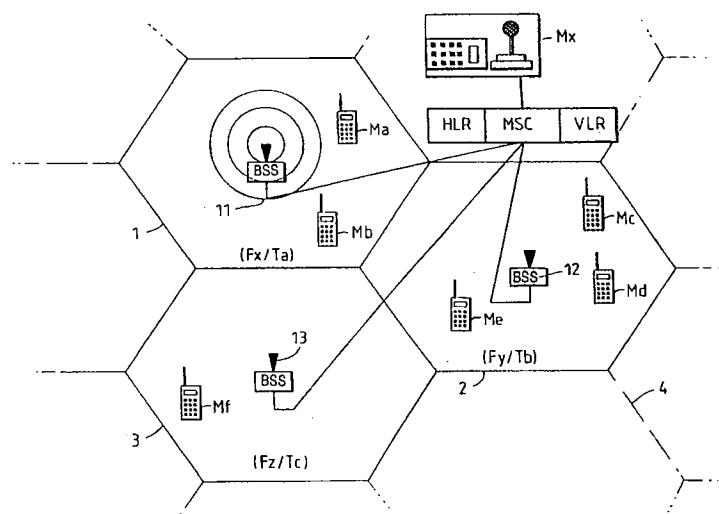
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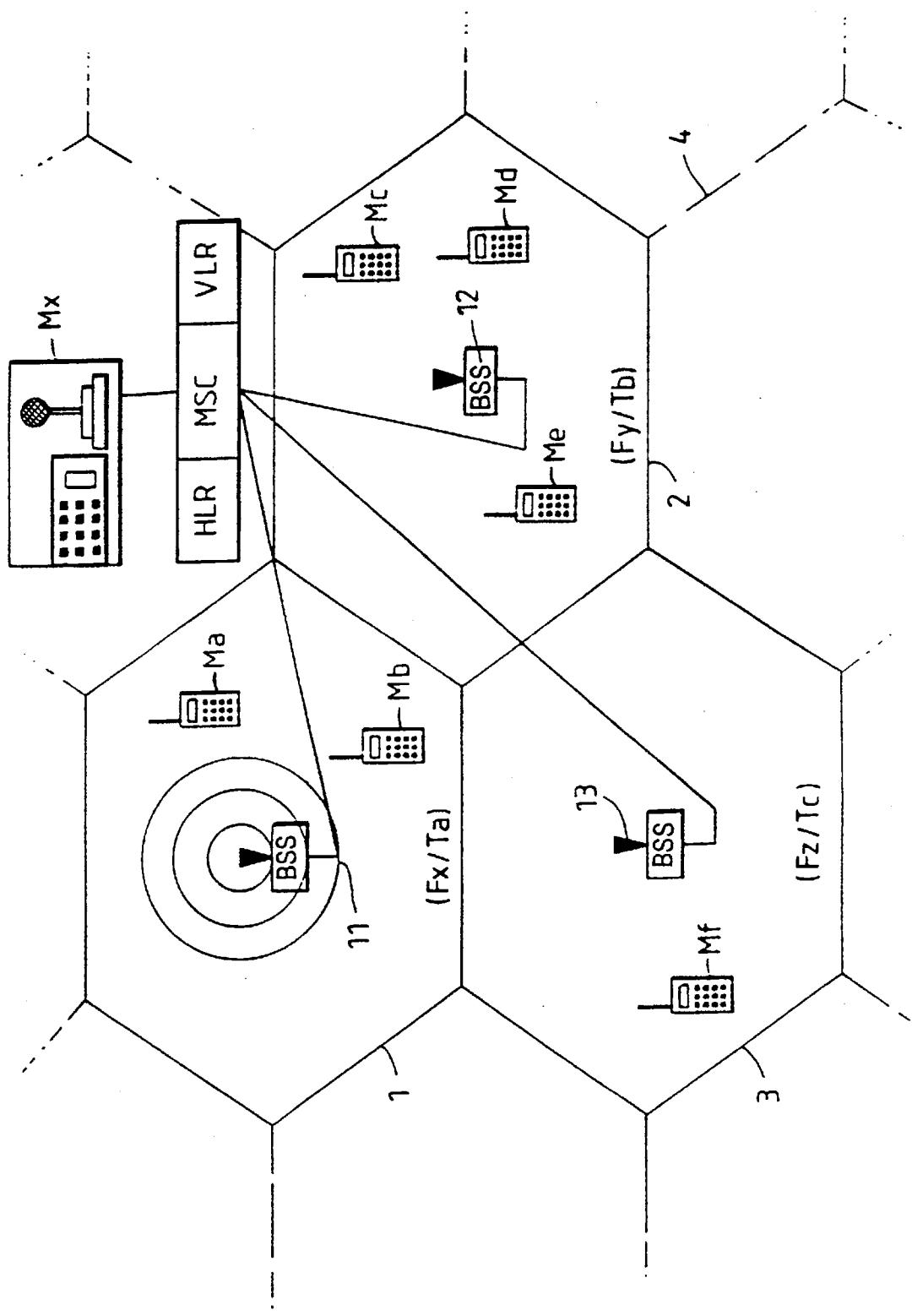
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[57] ABSTRACT

In a cellular radio system the facility is provided for a call to be broadcast from a control center (for example an emergency service controller), or from any mobile unit to all of the others. Each cell allocates a single channel to the broadcast service, irrespective of the number of mobile units in the cell. This allows more efficient use of the available channels than the use of a separate channel for each mobile unit. In one embodiment no channel is allocated to a cell unless at least one mobile unit responds to a paging signal in that cell. Paging may continue throughout a broadcast call to allow a channel to be allocated when a mobile unit enters a previously unoccupied cell or to allow release of a channel should all mobiles leave a previously occupied cell. The broadcast facility can be provided on a cellular network which also supports other mobile units which do not receive the broadcast service, and whose operation is not affected by it.

14 Claims, 1 Drawing Sheet



BROADCAST CHANNEL SEIZURE WITH ALLOCATED SINGLE TRAFFIC CHANNEL PER OCCUPIED CELL IN A CELLULAR SYSTEM

CROSS-REFERENCE TO RELATED APPLICATION

This application is a continuation-in-part of our copending commonly assigned application Ser. No. 08/179,961 filed Jan. 11, 1994.

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to cellular radio systems.

2. Related Art

A typical cellular radio system includes a number of base stations linked together to form a network, the base stations being under the control of a mobile switching center which can also have a connection to a fixed network. Each base station has one or more antennas for providing radio coverage within an area around the base station. This area is known as a cell. Each base station is capable of radio communication with a number of mobile units operating in its cell.

In order to set up a call to a mobile unit, the mobile switching center sends out a paging signal to all the base stations. If the mobile unit which is being paged responds, the base station which receives the response allocates a channel, from a number of channels available to it, for communication with the mobile unit.

In a conventional cellular radio system a mobile unit does not hold on to the same resource (radio channel) throughout its call. As the mobile progresses from one cell to another within the network, handover from a resource in the old cell to another resource within the new cell is performed by switching to a new channel. This allows the mobile unit to roam over specific geographic areas without significant interruption to the communication path, while allowing re-use of released resources by other mobile units. Existing cellular radio systems are designed for use by individual mobile units making and receiving calls on a one-to-one basis, so that a mobile unit can be connected to one other mobile unit on the cellular network, or to one terminal on an interconnected fixed network (eg PSTN). When a call is set up, the mobile unit is assigned a channel (defined by e.g frequency and/or timeslot) which, for the duration of the assignment, only that mobile can use.

For some purposes, in particular in the emergency services (ESs) such as fire, police, ambulance, coastguard, mountain rescue etc., there is a requirement for a control center (the "dispatcher") to be able to call to all mobile units simultaneously (known as a "broadcast" service) or for one mobile unit to call all the others (an "all-informed" service). However, these services require access to these facilities for only a small proportion of their operational requirements. It is thus wasteful of resources to devote equipment and spectrum in the radio band exclusively to the provision of such services. Other services with field forces such as taxi and public transport operators, utilities such as gas and telecommunications companies, and dispatch companies, also have a need to communicate with several members of the field force at once.

Many of these services' other communication requirements can be met by existing cellular systems. For example, existing systems allow calls to be made between an indi-

vidual mobile unit and the dispatcher, initiated by either party. However, existing cellular radio systems do not meet the requirements for the "broadcast" or "all-informed" service. It would be especially advantageous to support the requirements of the emergency services on a cellular system, because the emergency services' existing private networks have to have a high capacity to allow the system to cope with extreme situations, but this capacity is rarely required, and the system is generally under utilized.

Some cellular systems offer a supplementary service known as "multi-party calling" or "conference calling". This would allow a number of mobiles to communicate with the dispatcher and each other simultaneously. Call set-up can be initiated by any of the participants. However, multi-party calling presents some operational restrictions for the emergency services. In particular there is the need to set up calls individually; with the inherent time overhead, and the requirement for separate radio resources to be devoted to the system for each member of the multi-party call, which is wasteful of physical resources and can lead to capacity problems.

By the nature of their duties, the emergency services often have to deploy a large number of resources into a small area. This can put a heavy demand on the resources of the local base station of a cellular system if each unit requires its own channel. The base station might not be capable of meeting these capacity requirements, even if the emergency service mobiles are given priority over all other users. The nature of emergencies makes normal cell enhancement methods unsuitable for coping with these unpredictable sudden high demands.

SUMMARY OF THE INVENTION

According to a first aspect of the invention, there is provided a cellular radio system comprising a switching center and a plurality of radio base stations each having an associated plurality of traffic channels for servicing an associated cell, and a plurality of mobile units, characterized in that for each of a plurality of the radio base stations one of the associated channels can be dedicated to a broadcast service, and a selected group of at least some of the mobile units each have means for establishing the channel associated with the broadcast service, so that a call from the switching center can be transmitted by a base station over the dedicated channel to the selected group of mobile radio units within the respective cell.

In one embodiment of the invention, each base station within the cellular system has a channel permanently dedicated to the broadcast service. In an alternative embodiment each base station comprises means for transmitting a paging signal, each mobile unit of the selected group having means for transmitting a response to the paging signal, and means for dedicating a channel to the broadcast service at only those base stations which receive one or more such responses.

According to a second aspect of the invention, there is provided a cellular radio system comprising: a switching center and a plurality of radio base stations each having an associated plurality of traffic channels for serving an associated cell, and a plurality of mobile units, characterized in that for each of a plurality of the radio base stations one of the associated channels can be dedicated to a broadcast service, and a selected group of at least some of the mobile units each have means for establishing the channel associated with the broadcast service, so that a call from the switching center can be transmitted by a base station over

the dedicated channel to the selected group of mobile radio units within the respective cell, each base station comprising means for transmitting a paging signal and means for dedicating a channel to the broadcast service at only those base stations which receive one or more responses to the paging signal, each mobile unit of the selected group having means for transmitting such a response to the paging signal.

In this arrangement, it is advantageous to provide means for repeating the paging signal periodically throughout a broadcast. It can be arranged that the channel dedicated to the broadcast service may then be released if no mobiles continue to respond to the repeated paging signal in a particular cell. Moreover, it can be arranged that a channel to be allocated part of the way through a broadcast if a mobile enters a cell in which there are no others already present.

The plurality of base stations from which the broadcast service can be transmitted may be selected according to the area of coverage required, for example administrative district covered by the user of the broadcast service.

In a preferred embodiment there is the facility for a broadcast to be initiated from one of the mobile units, to provide the "all-informed" service described above. The term "broadcast" as used in this specification hereinafter embraces such a service.

Means may be provided for supporting a plurality of broadcast services to different groups of mobile units, arranged such that for each of a plurality of the base stations one of the associated channels can be allocated to each broadcast service. This allows several broadcast services for different user groups to be supported at once. Different groups of the base stations may support different groups of the broadcast services to allow for different but overlapping geographical coverage requirements.

For some embodiments the use of conventional mobile radio handset units may be possible. For example, in systems in which broadcast service is initiated by paging, the units may have means to allow them to respond to a special broadcast service paging signal, but alternatively, the system may simply identify the unit as being one subscribing to the broadcast service by matching its identification code with, for example, an additional look-up table in that part of the system which identifies whether a mobile unit is authorized to use the cellular network. However, for many of the preferred arrangements, described below, specially adapted radio units may be required.

In an embodiment in which a single channel is permanently allocated to the broadcast system, it is advantageous for mobile radio units for use in that system to have means to monitor the broadcast channel while they are operating on another channel, (e.g. in normal cellular mode), and are arranged to switch to the broadcast channel if traffic is detected on that channel. Where a broadcast may be initiated from one of the mobile units, it is advantageous for the units to include means for inhibiting transmission by the unit on the broadcast channel if other traffic is detected on that channel, to ensure that only one unit is broadcasting at a time. Moreover, if the unit were to continue receiving at the same time as it is transmitting on the broadcast channel echo effects and/or feedback howl could be caused. It is therefore advantageous to include means for inhibiting reception by the unit when it is transmitting on the broadcast channel.

BRIEF DESCRIPTION OF THE DRAWINGS

Preferred embodiments of the invention will be described with reference to the drawing, which schematically repre-

sents a cellular radio system of the embodiment of its coverage area for broadcast purposes.

DETAILED DESCRIPTION OF EXEMPLARY EMBODIMENTS

This coverage area consists of three cells, (Cell 1, 2 and 3) which form part of a larger cellular network (indicated by dotted lines in the figure). In each cell, there is a base station system (BSS) for establishing radio contact with the mobile units (Ma, Mb etc) within the cell.

A mobile switching center (MSC) controlling the cellular network has associated with it a home location register (HLR) and visitor location register (VLR) as is conventional in cellular systems such as the GSM Pan-European digital cellular system.

The operator of the broadcast service, typically a dispatcher for an emergency service, has a control point which has a link to the Mobile Switching Center. The control point may be co-located with the mobile switching centre, but will usually be elsewhere.

The two embodiments to be described with reference to the drawing differ in the method by which channels are allocated to support the broadcast service. The first uses a fixed or dedicated broadcast channel, and the second uses a flexible broadcast channel allocation.

These broadcast channels must not be confused with a broadcast control channel, in GSM known as BCCH; which provides control signalling information for the cellular network as a whole. In particular, the broadcast control channel provides the paging function required in order to identify the location of a mobile unit when an incoming call for that unit is made. These control channels are merely signalling channels carrying signalling data. The broadcast channels in this invention are additional to this, and in normal circumstances carry speech.

In the FIGURE the three cells 1, 2 and 3 represent the coverage area in which the mobiles subscribing to the broadcast service are intended to operate. They might, for example, represent the area covered by a single police force. The network as a whole may provide broadcast services for more than one service, for example, police forces in adjacent areas. Moreover, different emergency services may have their own broadcast services within the same area, or overlapping areas, each one being allocated its own channel, or its own paging signalling. Each of the cells 1, 2 and 3 has a base station, identified as 11, 12 and 13 respectively and there are a number of mobile units identified Ma, Mb, Mc, Md, Me and Mf which can roam throughout the cellular network. The dispatcher or control point is identified by Mx.

Considering the fixed broadcast channel embodiment first, each base station has an allocated emergency channel, having a specified frequency (Fx, Fy, Fz) and time slot (Ta, Tb, Tc). A mobile unit forming part of the broadcast system will be set to continually monitor this channel. The mobile units can also operate in the same way as normal mobile units, ie. they are able to make and receive point to point calls. As mobile units (Ma-Mf) roam through the policing area, each unit monitors the respective broadcast channel for the cell it is in. The broadcast channel is identified over the broadcast control channel, which a mobile unit normally monitors for paging information and other control data, so that as the mobile unit passes from one cell to another the broadcast control channel information will direct it to monitor the broadcast channel of the new cell. Alternatively instead of being directed by the control channel, the mobile unit may be arranged to tune to the broadcast channel offering the best level of quality, ie. the highest signal level.

When the dispatcher at control point Mx is required to make a broadcast, he selects the broadcast area in which he wishes the call to be made (which may be just one cell, or all cells, or any subset of the whole), and then broadcasts the message. Those mobile units in their idle state are already tuned to the broadcast channel in the selected areas, so they are immediately capable of receiving calls. Any mobile units involved with point-to-point calls are informed that a broadcast call is starting so that they can also tune to the broadcast channel. This broadcast call indication can be arranged to cause any such point-to-point calls to be terminated automatically, or it may allow the user operating the mobile unit to select whether to listen in to the broadcast call or continue with the point-to-point call.

When the broadcast is finished, the dispatch centre will release the call, and the mobile unit returns to monitoring the broadcast channel.

Normally mobiles in a cellular system are required to perform a location update when entering a new location area or at predetermined intervals. Location areas are specified by the network operator and location area information is broadcast to all mobiles over the broadcast control channel. The mobiles normally retain location information and compare it with subsequently received information to determine whether a location update is required. In particular, if the location information broadcast over the broadcast channel has changed, this is indicative that the mobile unit is now within range of a different base station.

The handover process for the broadcast channel operates entirely within the mobile unit, which determines which cell is going to provide the best level of service, based on measurements either of the broadcast channel or of the control channel taken within the mobile unit. If the mobile unit roams outside the broadcast area altogether (ie. in FIG. 1 outside cells 1, 2 and 3, for instance into cell 4) then it will drop out of any broadcast call.

The mobile unit may of course still communicate with its own dispatcher (or any other dispatcher) by virtue of still being within the conventional cellular network. This is an advantage over existing private mobile systems, which have no out-of-area capability.

A mobile unit, on performing location update, will pass its identity to the network, which is then used to determine the home location register (HLR) address to which the VLR (Visitor Location Register) has to pass the location update information. The Home Location Register, on receiving the update, will pass service information back to the new VLR and delete all previous entries for that mobile at any previous VLR.

Where a generic broadcast identity is used the emergency service mobiles should not use it for location updating, instead they use their own specific identity. The HLR has a permanent VLR address entry stored in it for the broadcast service which covers the broadcast area, i.e. there is a fixed relationship between the broadcast area and the broadcast identity, VLR and HLR. Generally, all the information is pre-stored in the HLR without any need to download to the VLR.

The broadcast areas can be tailored to fit the individual Emergency or other Service operating areas. This has the advantage of reducing location update information and provides a means of indicating to the mobile that it is out of the broadcast coverage area, and reducing the signalling overhead by not transmitting paging signals in those cells where a mobile unit should not be found. The area may be an administrative district, such as a Police Authority's

jurisdiction, or may be selected according to the nature of the user; for example limiting the broadcast to only those cells covering the routes operated by a public transport operator.

The cellular system can support conventional mobile units (not equipped to monitor the emergency channel) without modification. The presence of the emergency channel will have no effect on these units whatsoever.

If it is desired to use encryption in the broadcast channel, a facility which is particularly useful for the emergency services, this can be provided comparatively easily in the fixed channel system. The encryption algorithm may be carried out over the air interface, for example to allow the fixed channel allocated to be changed on a predetermined basis known only to the operating system and encryption software in the mobile units. Alternatively, the emergency services may prefer to run their own encryption algorithm end to end, with no further encryption over the air interface.

Although the fixed broadcast service describe above has a number of advantages, a particular disadvantage with providing such a system is that resources (in particular a radio channel) have to be permanently reserved within each cell in the broadcast area whether or not they are actually being used. The flexible option now to be described moves away from a permanent, fixed allocation, to one which is demand allocated. This allows more efficient use of the resources in the broadcast area, at the expense of some greater complexity. Since emergency services in particular are likely to be allocated the highest degree of priority there should be no problems in making a channel available for the broadcast service, even if this means an existing point-to-point call has to drop out.

To provide a flexible broadcast channel each mobile unit is allocated two identities; namely the unique identity which can be used for individual calls, as a standard cellular mobile unit, and an operational group identity for broadcast calls.

The basic operation of the mobile unit remains the same as in standard cellular practice in that the mobile unit is able to make and receive point-to-point calls. To set up a broadcast call a broadcast group identity is paged by all the base stations 11, 12, 13 in the broadcast area. Each mobile unit operating in the broadcast area which has that broadcast group identity responds to the base station as to a normal page. The first unit in each cell to respond is allocated a channel e.g. (Fx/Ta in Cell 1). Should there be another mobile unit in the same cell (e.g. Mb), it is instructed to tune to the same channel. In this way only one channel is required for each cell, as in the previous embodiment. However, unlike the previous embodiment, if no mobile responds in a particular cell, no channel is allocated in that cell.

This approach is more efficient in use of resources than the fixed mode, because it only requires the use of a channel in those cells in which there are mobile units subscribing to the broadcast system.

If, at the time of paging, one of the emergency service mobiles is engaged on a point-to-point call, that call will be terminated. The channel allocated to that call can then be used for the broadcast service. If no emergency service mobile is currently engaged on a point-to-point call a free channel is allocated, or if none are free, one is seized from a lower-priority call. Ideally, a warning message will warn the callers that this is about to happen, and why.

Once the physical channel has been determined, the base station will set up a connection to the mobile switching center. Each base station involved in the broadcast area is connected to the dispatch center Mx via the switching center

MSC, where there will be a multiple connection conference bridge for interconnecting the traffic service to the dispatcher. This conference bridge does not need to be as complex as it would be for a conference between all the mobiles working independently in a conventional manner, since only one connection to the bridge per base station instead of one per mobile is needed.

The mobile units have their transmitters disabled while the service is running, so a base station will not get any information on the unlink from the mobile unit. This means that the mobile will not receive any power control or timing advance information.

When the broadcast facility is no longer required, the dispatcher releases the call which stops the paging and releases the resources at each cell in the broadcast area. The mobile units can then resume normal cellular operation.

In this second embodiment, handover arrangements are somewhat different from those in the first embodiment. As a mobile unit, for example Mb, moves from the coverage of the broadcast channel in cell 1, it will normally drop out of the broadcast group in that cell. This drop out decision is taken by the mobile unit and is based on quality of service measurement. Conventional handover techniques cannot be used in this situation, because in the broadcast service the movement of a mobile between cells does not necessarily require the allocation of a new channel in the new cell or the release of one in the old cell (as it would in a conventional handover) since other mobiles may be present in either or both cells. Instead, the paging procedure is repeated at intervals throughout a broadcast call. Should a mobile respond in a cell to which no channel is currently allocated (i.e. it has entered an empty cell) a channel will be allocated. A mobile unit may miss initial page attempts for the broadcast service, but an appropriate repetition rate will minimize the level of speech loss which could occur while the mobile is finding the new channel. This handover process can be speeded up by using the broadcast control channel to broadcast the physical channel data for each active cell in the broadcast group to the mobiles.

If no mobiles respond to a page repetition from a base station then it may be assumed that there are no longer any mobiles in the cell and the channel can be released. However, because of the possibility that a mobile is still in the cell but has missed a paging attempt the channel is only released after a number of successive paging attempts fail to get a response.

When the broadcast facility is no longer required then the broadcast center releases the call which stops further pages and releases the resources at base stations and mobiles.

The location management is similar to that in the fixed channel embodiment described above.

Encryption may be provided in the flexible broadcast embodiment in the same manner as described under the fixed channel embodiment described above. Alternatively there may be a more flexible approach, more in tune with the way in which conventional cellular systems operate.

This approach requires that the broadcast service mobile units Ma to Mf are first authenticated over a dedicated signalling resource before the mobile is permitted to move to the shared physical channel. In much the same way as in standard cellular radio encryption systems the encryption key is generated from a random number during the authentication process. The mobile responds to the visitor location register with a response which is then checked before encryption begins. However, it must be noted that all elements in the system have to use the same random number

and generate the same encryption key for each mobile in a serving cell so that they can share the same physical channel. The allocation of the special group identity must also be supported by the same allocation of a secret key, otherwise a different response will be returned to the VLR and a different encryption key generated for each member of the group.

There may be a requirement to provide the broadcast service in specific geographical areas, for example different police force areas. This could be provided through tailoring of the paging to certain base stations only. In general the paging area is pre-defined by the operator and managed by the VLR. This means that for all calls, the same base stations are used for paging. If, however, a link is made between the mobile station identity and the paging area in the VLR it would be possible for an operator to provide paging for specific identities only when they are in specified areas. Thus the flexible mobile system has the advantage of being a more efficient use of channel resources in the cellular radio system, at the expense of some complexity and a slower response time for call set-up and handover.

Either system described above can support an "all-informed" service, in which a message from a mobile Ma can be heard by all others. The call set-up is as described above, except that it is initiated from mobile Ma instead of the control point Mx. Mobile Mb will therefore be allocated the same channel as Ma because it is in the same cell. In order to avoid the delayed speech being heard by the speaker, the mobile Ma making the transmission must have reception inhibited. The mobile units Ma, Mb, Mc, Md, Me, Mf are designed so that transmission is inhibited if any traffic is detected on the channel, so that only one mobile can transmit at once.

The mobile unit must determine a timing advance, in order to transmit on the up-link portion of the broadcast channel. A random access burst is passed to the base station on the uplink of the broadcast channel, and a timing correction is calculated and passed to the mobile by means of the downlink portion of the broadcast channel. Once timing correction has been attained the mobile unit can then transmit. The transmitting mobile's speech can be retransmitted in the downlink broadcast channel provided that a conference facility is available in the operational control room. The mobile which is transmitting must inhibit its own receiver to prevent reception of its own speech after a time delay. While the mobile is transmitting on that channel the other mobile units are inhibited from making broadcasts because traffic is detected on the channel. This can be achieved most easily by providing a "press to talk" button on the mobile unit. The "press to talk" button will allow the mobile unit to transmit (provided that no other mobile or the dispatcher is already transmitting on the channel) and inhibit reception.

One mobile switching center could support more than one broadcast network, which may cover different broadcast areas (e.g. different police authorities) or may have overlapping broadcast areas (e.g. fire, police and ambulance services within the same area).

The invention therefore allows a broadcast facility to be provided to or between a number of mobile units within a cellular system. General traffic can be carried on the same system in a conventional manner.

Although the broadcast service has been described with reference to use by the emergency services, the facility could also be provided for other users who require similar facilities such as taxi operators, parcel couriers, railway operators etc.

What is claimed is:

1. A cellular radio system comprising:

a switching center and a plurality of radio base stations, each having an associated plurality of traffic channels for serving an associated cell,

a plurality of mobile units,

each of a plurality of the radio base stations having at least one of its associated channels capable of being dedicated to a broadcast service, and

a selected group of at least some of the mobile units each having means for establishing the channel associated with the broadcast service, so that a call from the switching center can be transmitted by one of said base stations over the channel associated with the broadcast service to the selected group of mobile units within the cell,

each base station including means for transmitting a paging signal as part of an initial call set-up and handover process and periodically throughout a broadcast call as part of a handover process and means for dedicating one of said channels to the broadcast service at only those base stations which receive one or more responses to the paging signal,

each mobile unit of the selected group having means for transmitting such a response to the paging signal.

2. A cellular radio system comprising:

a switching center and a plurality of radio base stations, each having an associated plurality of traffic channels for serving an associated cell,

a plurality of mobile units,

each of a plurality of the radio base stations having at least one of its associated channels capable of being dedicated to a broadcast service,

a selected group of at least some of the mobile units each having means for establishing the channel associated with the broadcast service, so that a call from the switching center can be transmitted by one of said base stations over the channel associated with the broadcast service to the selected group of mobile units within the cell,

each base station including means for transmitting a paging signal and means for dedicating one of said channels to the broadcast service at only those base stations which receive one or more responses to the paging signal,

each mobile unit of the selected group having means for transmitting such a response to the paging signal,

means for repeating the paging signal periodically throughout a broadcast, and

wherein in each cell, one of said channels continues to be dedicated to the broadcast service only if one or more of the mobile units continue to respond to the repeated paging signal in that cell.

3. A cellular radio system as in claim 1 or 2 in which each base station has means for transmitting over a control channel the identity of the channel dedicated to the broadcast service.

4. A cellular radio system as in claim 1 or 2 in which a broadcast may be initiated from one of the mobile units.

5. A cellular radio system as in claim 4 comprising means for initiating a broadcast transmission on a duplex channel from a mobile unit using an uplink part of the duplex channel dedicated to the broadcast service.

6. A cellular radio system comprising:

a switching center and a plurality of radio base stations, each having an associated plurality of traffic channels for serving an associated cell,

a plurality of mobile units,

each of a plurality of the radio base stations having at least one of its associated channels capable of being dedicated to a broadcast service,

a selected group of at least some of the mobile units each having means for establishing the channel associated with the broadcast service, so that a call from the switching center can be transmitted by one of said base stations over the channel associated with the broadcast service to the selected group of mobile units within the cell,

each base station including means for transmitting a paging signal and means for dedicating one of said channels to the broadcast service at only those base stations which receive one or more responses to the paging signal,

each mobile unit of the selected group having means for transmitting such a response to the paging signal,

means for repeating the paging signal periodically throughout a broadcast,

wherein in each cell, one of said channels continues to be dedicated to the broadcast service only if one or more of the mobile units continue to respond to the repeated paging signal in that cell, and

wherein during a broadcast, if a response to a paging signal is received from a mobile unit in a cell in which no one of said channels is currently dedicated to the broadcast service, one of said channels is then dedicated to the broadcast service in that cell.

7. A cellular radio system comprising:

a switching center and a plurality of radio base stations each having an associated plurality of traffic channels for serving an associated cell,

a plurality of mobile units,

each of a plurality of the radio base stations having at least one of its associated channels capable of being dedicated to a broadcast service, and

a selected group of at least one of the mobile units each having means for identifying the channel associated with the broadcast service and switching to reception on the said channel when a broadcast is transmitted, so that a call from the switching center is transmitted by one of said base stations over the channel associated with the broadcast service to the selected group of mobile units within the cell,

each base station including means for transmitting a paging signal,

each mobile unit of the selected group including means for transmitting a response to the paging signal, and means at each base station for dedicating a channel to the broadcast service at only those base stations which receive one or more such responses,

wherein if one or more mobiles respond to a page in one of said associated cells which no one of said channels is free, one of said channels is seized from an existing call.

8. A cellular radio system as in claim 7 having means for transmitting a warning message to the parties to the existing call before one of said channels is seized.

9. A cellular radio system comprising:

a switching center and a plurality of radio base stations, each having an associated plurality of traffic channels for serving an associated cell,

a plurality of mobile units,

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each of a plurality of the radio base stations having at least one of its associated channels capable of being dedicated to a broadcast service, and

a selected group of at least some of the mobile units each having means for establishing the channel associated with the broadcast service, so that a call from the switching center can be transmitted by one of said base stations over the channel associated with the broadcast service to the selected group of mobile units within the cell,

each base station including means for transmitting a paging signal as part of an initial call set-up and handover process and means for dedicating one of said channels to the broadcast service at only those base stations which receive one or more responses to the paging signal,

each mobile unit of the selected group having means for transmitting such a response to the paging signal,

wherein if one or more mobiles respond to a page in one of said associated cells which no one of said channels is free, one of said channels is seized from an existing call.

10. A cellular radio system as in claim 9 having means for transmitting a warning message to the parties to the existing call before one of said channels is seized.

11. A cellular radio system comprising:

a switching center and a plurality of radio base stations each having an associated plurality of traffic channels for serving an associated cell,

a plurality of mobile units,

each of a plurality of the radio base stations having at least one of its associated channels capable of being dedicated to a broadcast service, and

a selected group of at least some of the mobile units each having means for identifying the channel associated with the broadcast service and switching to reception on the said channel when a broadcast is transmitted, so that a call from the switching center is transmitted by one of said base stations over the channel associated with the broadcast service to the selected group of mobile units within the cell,

each base station including means for transmitting a paging signal,

each mobile unit of the selected group including means for transmitting a response to the paging signal,

means at each base station for dedicating a channel to the broadcast service at only those base stations which receive one or more such responses, and

12

means for repeating the paging signal periodically throughout a broadcast,

wherein if one or more mobiles respond to a page in one of said associated cells which no one of said channels is free, one of said channels is seized from an existing call.

12. A cellular radio system as in claim 11 having means for transmitting a warning message to the parties to the existing call before one of said channels is seized.

13. A cellular radio system comprising:

a switching center and a plurality of radio base stations, each having an associated plurality of traffic channels for serving an associated cell,

a plurality of mobile units,

each of a plurality of the radio base stations having at least one of its associated channels capable of being dedicated to a broadcast service,

a selected group of at least some of the mobile units each having means for establishing the channel associated with the broadcast service, so that a call from the switching center can be transmitted by one of said base stations over the channel associated with the broadcast service to the selected group of mobile units within the cell,

each base station including means for transmitting a paging signal and means for dedicating one of said channels to the broadcast service at only those base stations which receive one or more responses to the paging signal,

each mobile unit of the selected group having means for transmitting such a response to the paging signal,

means for repeating the paging signal periodically throughout a broadcast, and

wherein in each cell, one of said channels continues to be dedicated to the broadcast service only if one or more of the mobile units continue to respond to the repeated paging signal in that cell,

wherein if one or more mobiles respond to a page in one of said associated cells which no one of said channels is free, one of said channels is seized from an existing call.

14. A cellular radio system as in claim 13 having means for transmitting a warning message to the parties to the existing call before one of said channels is seized.

* * * * *

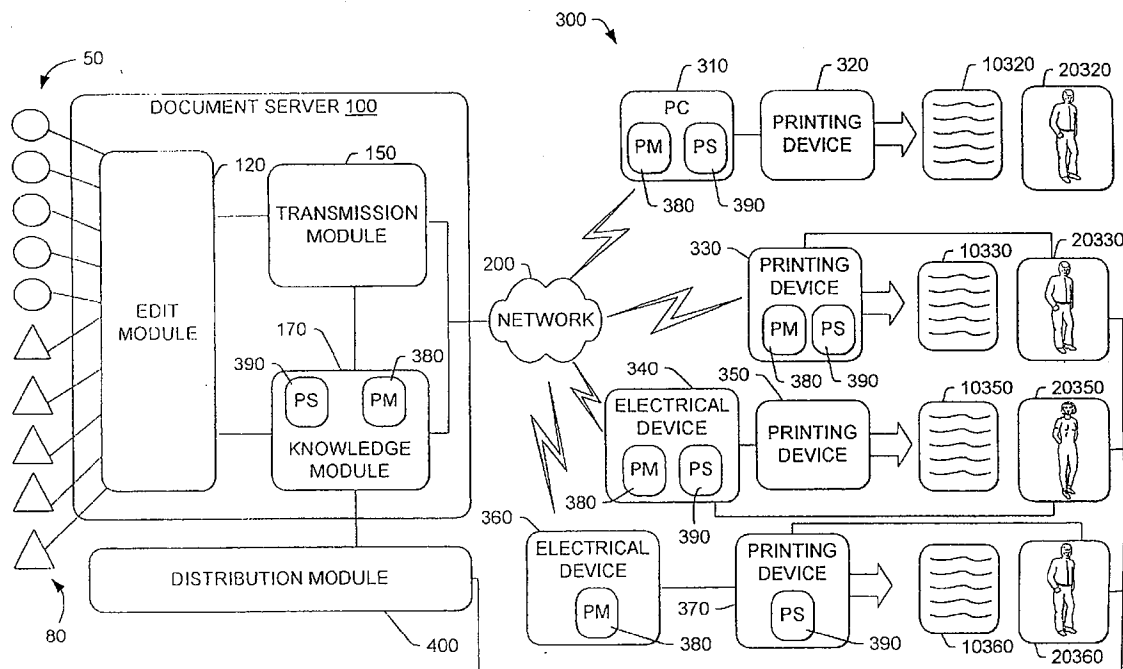
EXHIBIT C

(19) **United States**(12) **Patent Application Publication** (10) **Pub. No.: US 2002/0018241 A1****Brewster**(43) **Pub. Date:****Feb. 14, 2002**(54) **DOCUMENT DELIVERY SYSTEM FOR
AUTOMATICALLY SUSPENDING DELIVERY
OF AN ELECTRONIC DOCUMENT**(52) **U.S. Cl. 358/402**(76) **Inventor: Jon A. Brewster, Monmouth, OR (US)**

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Intellectual Property Administration
P.O. Box 272400
Fort Collins, CO 80527-2400 (US)**(21) **Appl. No.: 09/917,014**(22) **Filed: Jul. 26, 2001****Related U.S. Application Data**(63) **Continuation-in-part of application No. 09/325,040,
filed on Jun. 7, 1999.****Publication Classification**(51) **Int. Cl.⁷ H04N 1/00**(57) **ABSTRACT**

The present invention provides a method and apparatus for suspending delivery of electronic documents, that is, stopping and restarting electronic delivery of documents according to a user's preset schedule. The method may include the steps of entering a delivery schedule for the document into an electronic receiving device, and automatically suspending, without user intervention, delivery of the document based on the delivery schedule, then automatically restarting delivery at the time indicated by the user. In an electronic document delivery system, the apparatus for automatically suspending delivery of a document may include a scheduling unit and a suspension control unit. The scheduling unit is used to enter a delivery schedule for the electronic document into an electronic receiving device. The suspension control unit is coupled to the scheduling unit and automatically suspends and then restarts the delivery of the electronic document, without user intervention, based on the delivery schedule that is adjusted in accordance with a predetermined suspension scheme.

DOCUMENT DELIVERY SYSTEM 10

DOCUMENT DELIVERY SYSTEM 10

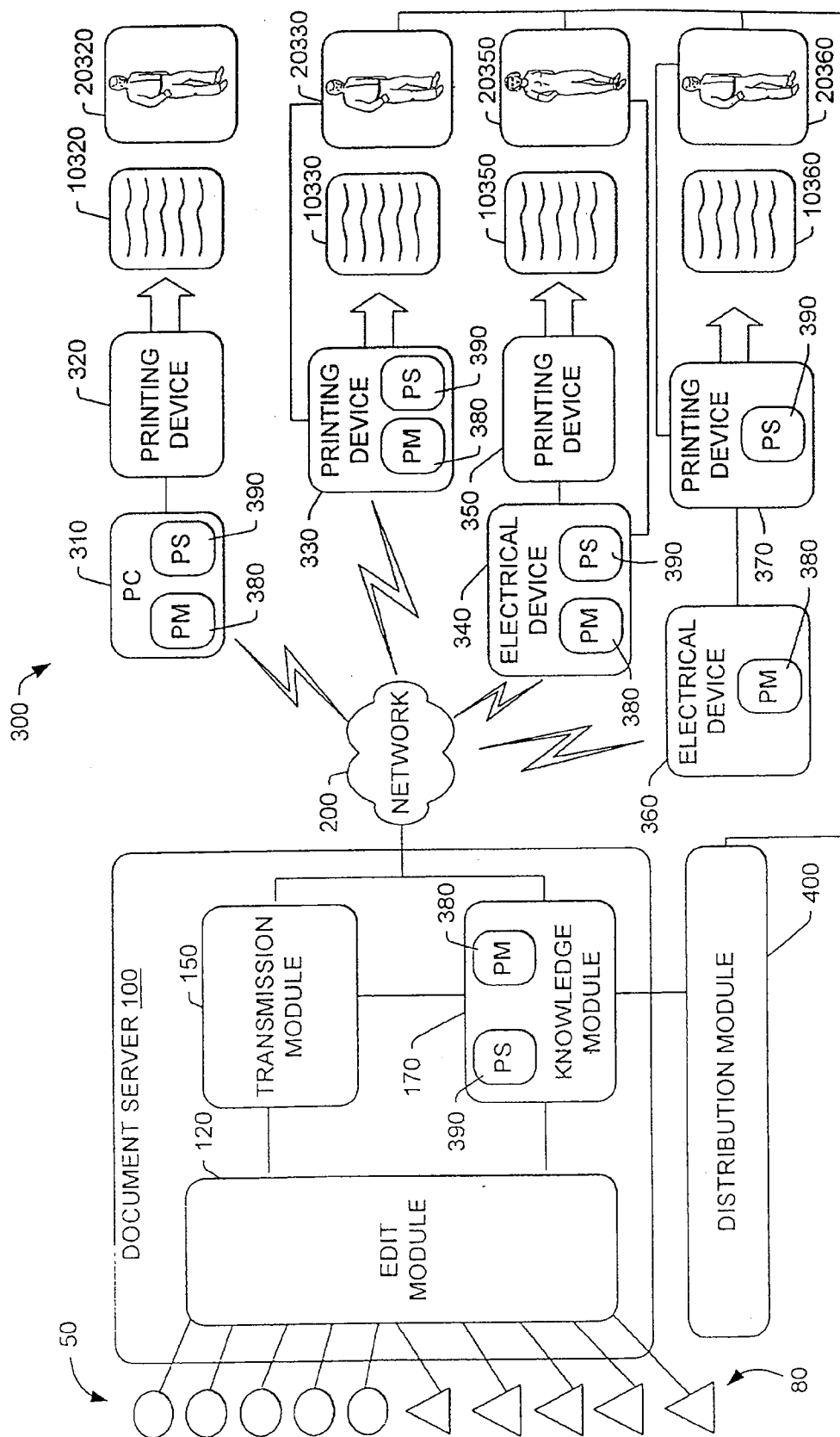


FIG. 1

FIG. 2

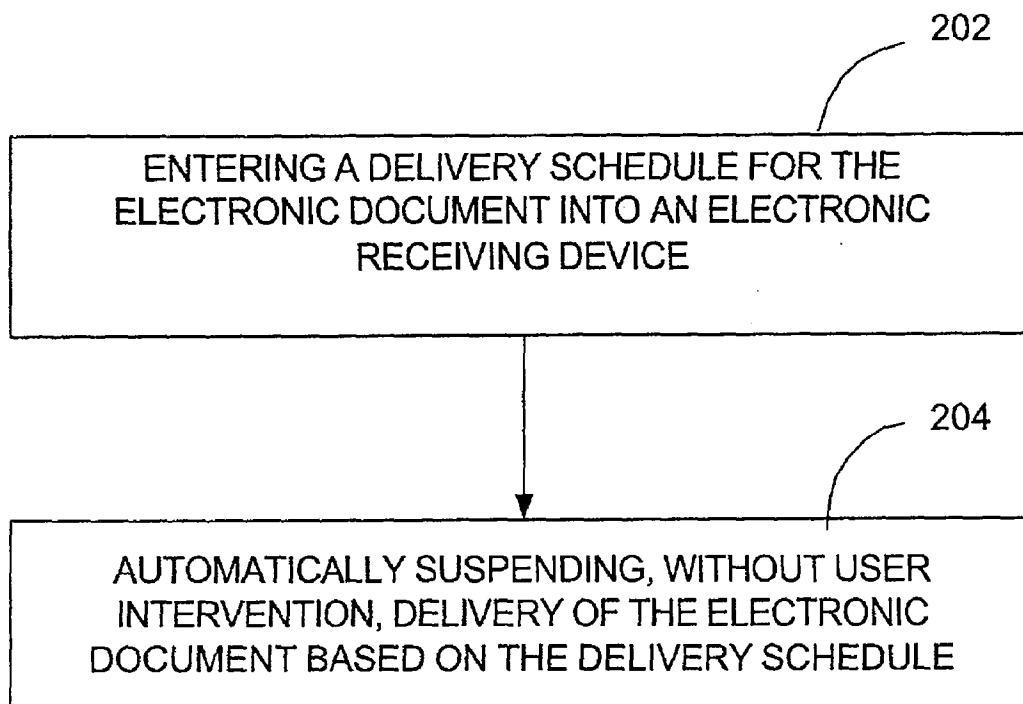


FIG. 3

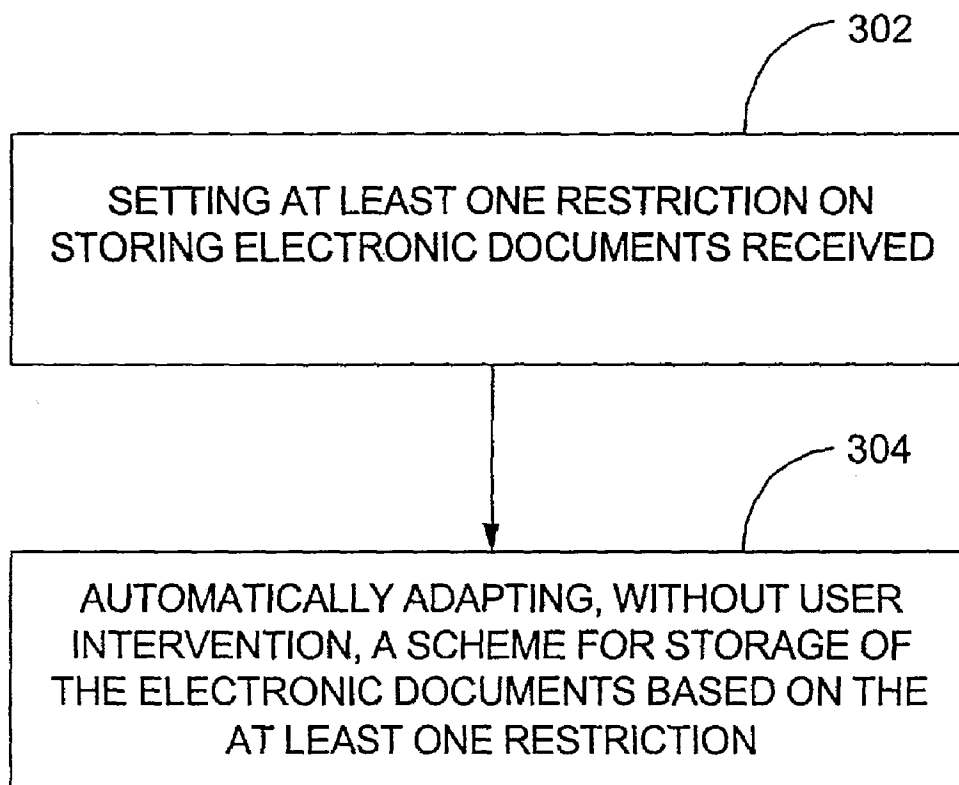


FIG. 4

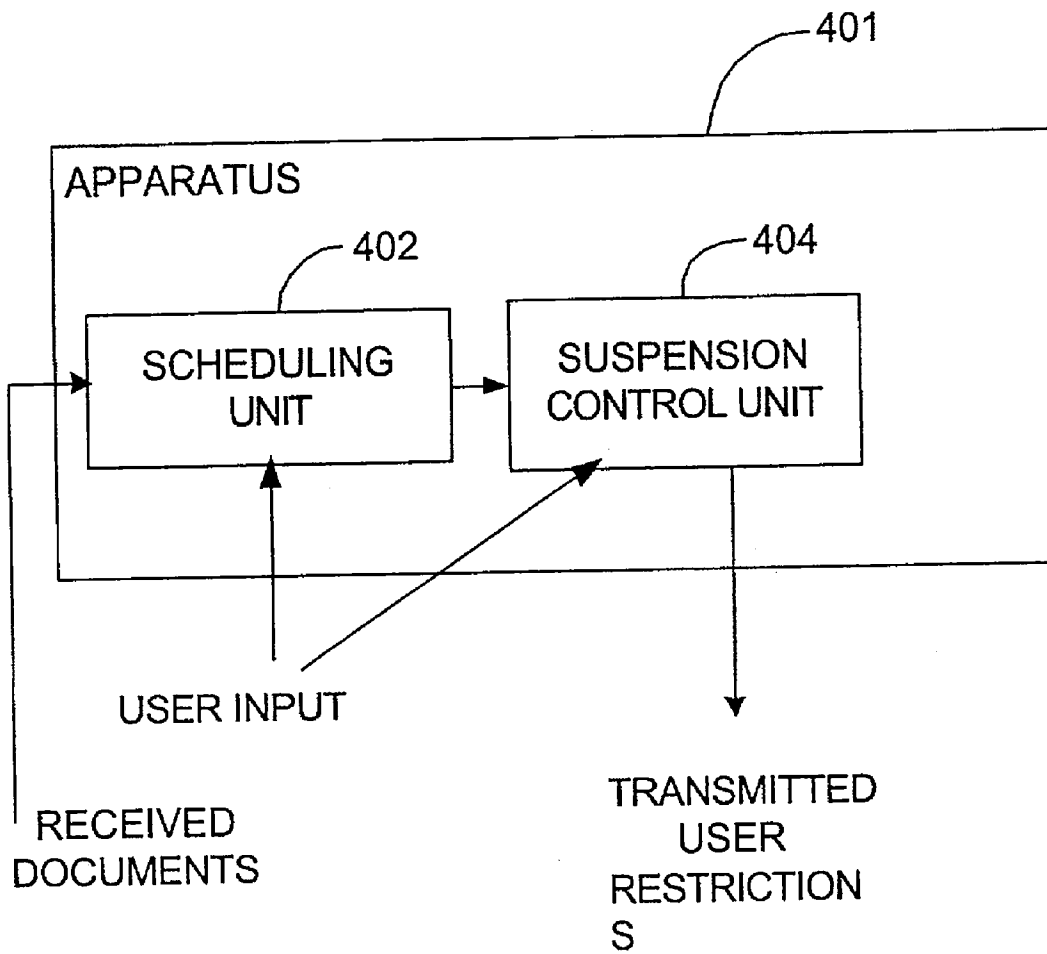
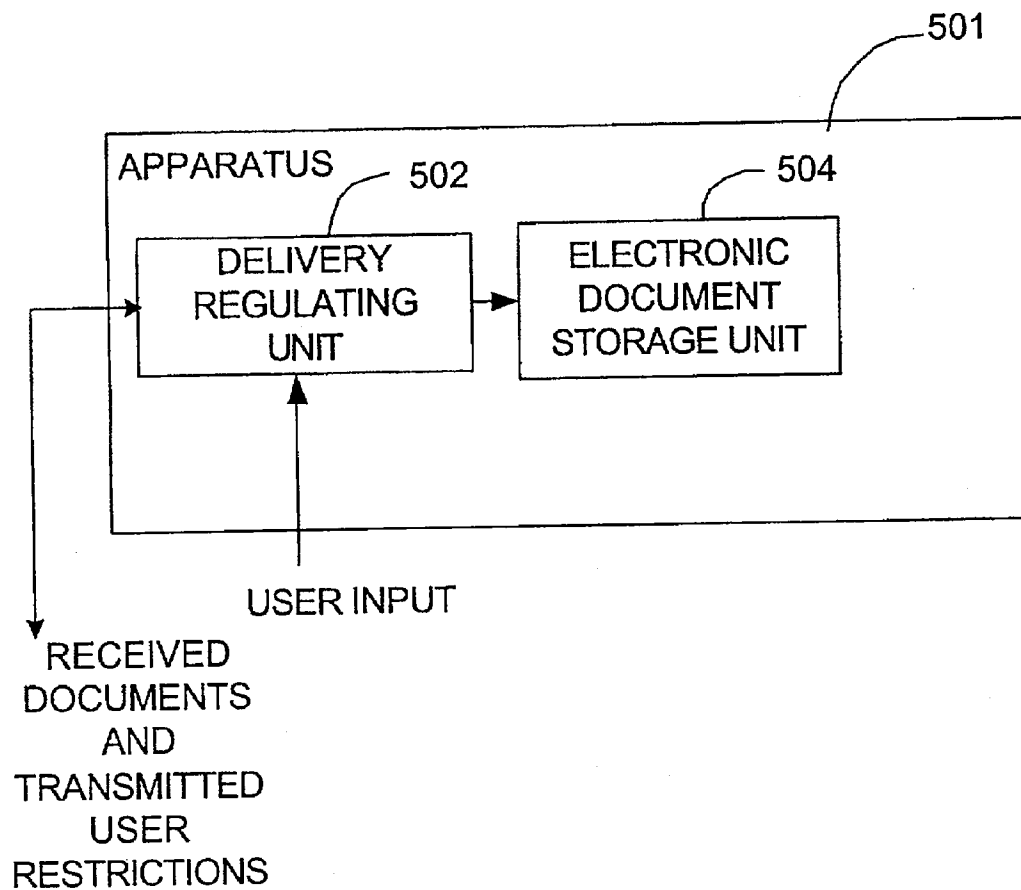


FIG. 5



DOCUMENT DELIVERY SYSTEM FOR AUTOMATICALLY SUSPENDING DELIVERY OF AN ELECTRONIC DOCUMENT

RELATED INVENTIONS

[0001] The present invention is a continuation-in-part of U.S. patent application Ser. No. 09/325,040 filed on behalf of Jon A. Brewster et al. on Jun. 7, 1999 and assigned to the assignee of the present invention.

FIELD OF THE INVENTION

[0002] This invention relates to the delivery of electronic documents. More particularly, the present invention relates to a document delivery system for automatically suspending delivery of an electronic device for a predetermined period of time.

BACKGROUND OF THE INVENTION

[0003] In the mid 1400's, Johann Gutenberg revolutionized how information is disseminated through his invention of the movable type press. With the publication of the Mazarin Bible, documents which were once held in the exclusive domain of a chosen few were now widely available to the masses. Nearly 550 years later, the mass media revolution that Gutenberg started is alive and well, complete with newspapers such as the New York Times and the Washington Post, magazines such as Newsweek and Sports Illustrated, and literally thousands upon thousands of other lesser known publications.

[0004] While these thousands of publications cover a wide range of interests, from news to sports to fashion to model rocketry, they have one thing in common: they are intended to be read by a mass market. Unlike the pre Gutenberg days, where a document would literally be read by only one person or a very small number of people, it is not economically viable for today's publications to have such a small readership, due at least in part to high marketing, production and distribution costs. In fact, many of today's publications are funded to a very large extent by the advertising contained within them. These advertisers are attracted to publications that can consistently deliver a large, reliable audience of consumers that will be exposed to their advertising.

[0005] While this mass market publication model has worked well for hundreds of years, it is not without its problems. One such problem is that a typical reader of a publication has a wide variety of interests, and no single mass market publication will be able to satisfy all these interests.

[0006] For example, a reader who is interested in international news, golf, fly fishing, Genealogy, and computers may have to subscribe to several different publications to satisfy these interests. Of course, since these publications are intended for a mass market, they will also contain a significant amount of material that our reader is not interested in and will not read. It goes without saying that if there is a significant amount of material a reader isn't reading, there is a significant amount of advertising the reader isn't reading either—as well as a significant amount of paper that is wasted. Advertisers know this, and agree to pay considerably less to a mass market magazine or newspaper per 1000 exposures to their ad than they would pay to a direct-mail

generator that can provide a more specific guarantee that the people exposed to their ad are of a demographic group that will be much more likely to read their ad and be interested in it.

[0007] In addition, it is neither cost-effective nor time effective for most readers to subscribe to and/or read a large number of publications. Generally, the typical reader will only subscribe to a few publications that are of the most interest to them. The reduced readership level of the publications our typical reader chooses not to subscribe to, even though he would be interested in at least some of the editorial and advertising content contained inside, means that the publication receives less subscription and advertising revenue than they otherwise would. If many other readers make the same decision, the continued health of the publication may be in jeopardy, and the publication may be forced to go out of business. In fact, many publications do go out of business yearly for failing to attract a sustaining number of advertisers and readers—even if there are a large number of readers that would be interested in reading their publication, and a corresponding number of advertisers anxious to have these readers exposed to their ads. In general, publications that fail to attract a substantial mass market of people willing to pay for and/or read them cease publication. This is a shame, since many of these publications would enrich the diversity of information available to all readers, and would provide an avenue for lesser known writers and artists to practice their wares.

[0008] In more recent years, a new type of publication has emerged: the electronic publication. Readers of these publications typically sign onto the Internet through their computer, and read the publications online. Some of these publications, such as CNN.com and pointcast.com, allow users to state personal preferences on what type of material they want to read. Often, these personalized electronic publications include advertising, usually in the form of a banner ad that is placed on the top of the screen.

[0009] While these electronic publications have been an interesting development in the distribution of information, they still represent a tiny fraction of the information that is published under the more traditional post-Gutenberg model. Many readers of these electronic publications complain that they are very difficult to read, especially for long periods of time. While it might be convenient for a reader to sign onto the Internet to look at the CNN.com web site for a brief summary of late breaking news, this reader would most likely only spend a few minutes at the site, and would likely still subscribe to the more traditional print media such as Newsweek or the Washington Post. They would also likely spend significantly more time reading the more traditional printed publication than they would spend reading the electronic publication, and correspondingly, spend more time being exposed to the ads in the traditional printed publication. Accordingly, printed publications continue to flourish today—more than five centuries after Gutenberg made them possible. A significant problem with sending documents electronically is that, when a reader is away from the location where he receives the electronic documents, such documents may accumulate and may ultimately simply take up an inordinate amount of space in the memory of the receiving party's computer. In addition, the receiving party may not wish to receive the electronic deliveries in his absence. Since electronic communications are being imple-

mented with greater and greater frequency, it is likely that, when a person is away from his computer for an extended period, he may receive a large number of electronic documents and may possibly trigger a protection mechanism in his memory storage that automatically starts eliminating the oldest documents when a predetermined amount of memory is filled, making space to store the newer documents. Alternatively, his system may not have such a protective mechanism, and when the memory is filled, the system may be unable to store more documents, causing the system to fail or the latest documents to be lost because there is no memory space in which to save them.

[0010] While these electronic deliveries have certainly benefited modern society, no significant attempt has been made thus far to solve the underlying problems with these electronic deliveries discussed above.

SUMMARY OF THE INVENTION

[0011] The present invention provides a method of suspending delivery of an electronic document for an electronic document delivery system. A delivery schedule is entered for the electronic document into an electronic receiving device. Without user intervention, delivery of the electronic document is automatically suspended based on the delivery schedule.

BRIEF DESCRIPTION OF THE DRAWINGS

[0012] FIG. 1 shows a block diagram of a document delivery system of one embodiment of the invention.

[0013] FIG. 2 is a flowchart showing the steps of one embodiment of a method in accordance with the present invention.

[0014] FIG. 3 is a flowchart showing the steps of another embodiment of a method in accordance with the present invention.

[0015] FIG. 4 is a block diagram of one embodiment of an apparatus in accordance with the present invention.

[0016] FIG. 5 is a block diagram of another embodiment of an apparatus in accordance with the present invention.

DETAILED DESCRIPTION OF THE EMBODIMENTS

[0017] FIG. 1 shows a block diagram of a document delivery system of one embodiment of a system that may be utilized by the invention. Document delivery system 10 contains document server 100. In one embodiment, document server 100 is operatively coupled via network 200 to a variety of personal computers, printing devices, and other electronic devices, collectively referred to as devices 300. Document server 100 contains edit module 120, transmission module 150, and knowledge module 170. Edit module 120 receives inputs from one or more content providers 50, and/or one or more advertising providers 80. Distribution module 400 is operatively coupled to document server 100. In the preferred embodiment, document server 100 is a minicomputer/server, such as an HP 9000 server sold by the Hewlett-Packard Company, although those skilled in the art will appreciate that document server 100 could be any type of other computing or electronic device(s) that performs the functions described herein and still fall within the spirit and scope of the invention.

[0018] Network 200 is preferably the Internet, although an Intranet, local area network, or other type of public or private network, either wired (e.g., telephone, cable TV, etc) or wireless (e.g., satellite, radio, cell phone, etc), could also or additionally be used.

[0019] Devices 300 are shown in FIG. 1 as being capable of being configured in a wide variety of ways. For example, personal computer 310 is shown connected to printing device 320, which prints document 10320 for user 20320. Personal computer 310 is operatively coupled to network 200. In contrast, printing device 330, which prints document 10330 for user 20330, is operatively coupled to network 200 without an intervening personal computer or other electronic device. Printing device 350, which prints document 10350 for user 20350, is shown connected to electronic device 340, which could be a set top box, television set, palmtop PDA or other type of electronic device that is operatively coupled to network 200. Finally, printing device 370, which prints document 10370 for user 20370, is connected to electronic device 360, which is operatively connected to network 200. The printing devices shown in FIG. 1 could be printers, such as the HP DeskJet 890 printer, HP LaserJet V printer, or other models of printers manufactured by HP or others; so-called "mopiers" or other multifunction printing devices that can print, fax, scan, and/or copy, or any other device capable of transferring information to a printable media such as plain paper, specialty paper, transparencies, or other media capable of tangibly receiving such information and which can be easily carried about by the user.

[0020] FIG. 2 is a flowchart showing the steps of one embodiment of a method in accordance with the present invention. In an electronic document delivery system, in the embodiment of the method of the present invention for suspending delivery of an electronic document shown in FIG. 2, the method includes the steps of entering 202 a delivery schedule for the electronic document into an electronic receiving device, and then automatically suspending 204, without user intervention, delivery of the electronic document based on the delivery schedule. Entering the delivery schedule may include storing a delivery suspension period for the electronic document. Where the electronic document is a recurring time basis publication, entering a delivery schedule may include replacing the electronic document by a later delivered electronic document for the recurring time basis publication each time a new publication of the electronic document arrives so that a latest available publication of the electronic document is stored. Also, entering a delivery schedule may include entering an instruction to suspend delivery indefinitely until reestablishment of delivery by a request by a user. In this manner, the user may choose to essentially delete an electronic subscription and restart it when he returns from, for example, a trip.

[0021] Entering the delivery schedule may also include entering an entire delivery list for delivery suspension, thus facilitating stopping electronic deliveries in a user's absence. Typically, the delivery schedule includes delivery of a plurality of electronically published documents, and may also, where selected, include delivery of electronic mail.

[0022] Generally, the electronic document delivery system controls delivery of electronic documents to a user's computer so that, similarly to stopping delivery of a physically

delivered newspaper while a user is away, delivery of electronic documents may be managed. However, the electronic document delivery system of the present invention may also be used to control delivery of electronic documents to a user's handheld device. Where desired, the delivery schedule may be modifiable remotely by a user.

[0023] Where the user is concerned about the amount of memory that may be used to store received electronic documents while he is away, the delivery schedule may be set to allow delivery of electronic documents that require less than a specified memory allocation size and to suspend delivery of electronic documents that require greater than or equal storage space compared to the specified memory allocation size.

[0024] FIG. 3 is a flowchart showing the steps of another embodiment of a method in accordance with the present invention. In this embodiment, the method controls storage of electronic documents received by utilizing the steps of setting 302 at least one restriction on storing electronic documents received, and then automatically adapting 304, without user intervention, a scheme for storage of the electronic documents based on the at least one restriction. Setting at least one restriction may include storing a suspension period during which electronic documents that are received are not stored. Additionally, where a received electronic document is a recurring time basis publication, setting at least one restriction may include replacing, in memory, a previous publication of the received electronic document by the received electronic document each time a new publication of a received electronic document arrives so that a latest available publication of the electronic document is stored.

[0025] Setting at least one restriction on storing electronic documents received may include entering an instruction to suspend delivery indefinitely until re-establishment of delivery by a request by a user, entering an entire delivery list for delivery suspension, regulating storage of at least one electronically published document that is received, regulating storage of at least one category of electronic mail that is received, or the like.

[0026] Generally, the present invention provides an electronic document delivery system that controls delivery of a plurality of electronic documents to a user's computer, or may, where desired, control delivery of electronic documents to a user's handheld device. Setting the restriction may be accomplished remotely by a user, if desired.

[0027] Where memory use is an issue, setting at least one restriction on storing electronic documents received may include allowing delivery of electronic documents that require less than a specified memory allocation size and suspending delivery of electronic documents that require greater than or equal storage compared with the specified memory allocation size.

[0028] As shown in FIG. 2, a printing module 380 for a personal computer (PC) 310, a printing device 330 or an electrical device 340, 360 may monitor a printing schedule 390 for a printing device 320. Typically, the printing module 380 may include an apparatus 401, 501 in accordance with the present invention. Alternatively, the apparatus 400, 500 may be located in the printing module 380 of the printing document server 100, and the user may adjust electronic

document suspension from his personal computer 310, printing device 330, or electrical device 340, 360.

[0029] As shown in the block diagram of FIG. 4, an apparatus 401 in accordance with the present invention that automatically suspends delivery of an electronic document may include a scheduling unit 402 and a suspension control unit 404. The scheduling unit 402 is used for entering a delivery schedule for the electronic document into an electronic receiving device. The suspension control unit 404 is coupled to the scheduling unit 402, and may be utilized for automatically suspending, without user intervention, delivery of the electronic document based on the delivery schedule in accordance with a predetermined suspension scheme. That is, the delivery schedule may be modified in accordance with the predetermined suspension scheme input by the user so that delivery of electronic publications is adjusted, for example, to fit a user's latest schedule. For example, a delivery suspension period for the electronic document may be entered, or where desired, the predetermined suspension scheme may provide for, where the document is a recurring time basis publication, replacing the document by a later delivered document for the recurring time basis publication each time a new publication of the document arrives so that a latest available publication of the document is stored.

[0030] The predetermined suspension scheme may also suspend delivery indefinitely until re-establishment of delivery when a request is made by a user. Generally, the predetermined suspension scheme includes suspension of delivery of at least one electronically published document. For even greater convenience, the predetermined suspension scheme may include suspension of an entire delivery list of electronic publications. The apparatus of claim 23, wherein the predetermined suspension scheme includes suspension of delivery of electronic mail.

[0031] The predetermined suspension scheme may be used to control delivery of electronic documents to a user's computer, to a user's handheld device, or the like. Also, where desired, the predetermined suspension scheme may be entered or altered remotely by the user.

[0032] Where desired, the predetermined suspension scheme may be set to allow delivery of electronic documents that require less than a specified memory allocation size and to suspend delivery of electronic documents that require greater than or equal storage space compared to the specified memory allocation size (memory not shown).

[0033] FIG. 5 is a block diagram of another embodiment of an apparatus 501 in an electronic delivery system in accordance with the present invention. The apparatus 501 controls storage of electronic documents received. Typically, the apparatus 501 includes a delivery regulating unit 502 and an electronic document storage unit 504. The delivery regulating unit 502 is used for setting at least one restriction on storing electronic documents received. The electronic document storage unit 504 is coupled to the delivery regulating unit 502. The electronic document storage unit 504 is used for automatically storing, without user intervention, the electronic documents received in accordance with the at least one restriction. Generally, the at least one restriction provides for utilizing a suspension period during which electronic documents that are received are not stored. Hence, when a user plans to be absent for a period of time, he may

enter a suspension period for an electronic document so that the memory (not shown) of his personal computer 310, printing device 340, or electrical device 340, 360 does not fill up while he is away.

[0034] Alternatively, where a received electronic document is a recurring time basis publication, the user may choose to enter a restriction that provides for replacing, in memory, a previous publication of the received electronic document by the received electronic document each time a new publication of a received electronic document arrives so that a latest available publication of the electronic document is stored. If a general suspension of storage of an electronic document is desired instead, the restriction may suspend delivery indefinitely until re-establishment of delivery by a request by a user.

[0035] For greater convenience, the restriction may simply suspend an entire delivery list. However, generally the at least one restriction on storing electronic documents received includes storage regulation of at least one electronically published document that is received. Similarly, the user may regulate storage of at least one category of electronic mail that is received.

[0036] Generally, the electronic receiving device is a user's computer, the user's handheld device or the like. For convenience, the restriction may allow remote entry or modification by a user. For example, if the user decides to extend his vacation for a week, he may remotely adjust suspension of selected electronic documents for an extra week. For more control of memory user, the at least one restriction on storing electronic documents received includes allowing delivery of electronic documents that require less than a specified memory allocation size and suspending delivery of electronic documents that require greater than or equal storage compared with the specified memory allocation size.

[0037] Thus, a method and apparatus has been described for providing user-selected restrictions that permit controlled suspension of receipt of electronic documents according to the present invention.

What is claimed is:

1. A method of suspending delivery of an electronic document, for an electronic document delivery system comprising the steps of:

entering a delivery schedule for the electronic document into an electronic receiving device; and

automatically suspending, without user intervention, delivery of the electronic document based on the delivery schedule.

2. The method of claim 1, wherein entering the delivery schedule includes storing a delivery suspension period for the electronic document.

3. The method of claim 1, wherein entering the delivery schedule includes entering a delivery suspension scheme that provides for, where the electronic document is a recurring time basis publication, replacing the electronic document by a later delivered electronic document for the recurring time basis publication each time a new publication of the electronic document arrives so that a latest available publication of the electronic document is stored.

4. The method of claim 1, wherein entering the delivery schedule includes entering an instruction to suspend delivery indefinitely until reestablishment of delivery by a request by a user.

5. The method of claim 1, wherein entering the delivery schedule includes entering an entire delivery list for delivery suspension.

6. The method of claim 1, wherein the delivery schedule includes delivery of a plurality of electronically published documents.

7. The method of claim 1, wherein the delivery schedule includes delivery of electronic mail.

8. The method of claim 1, wherein the electronic document delivery system controls delivery of electronic documents to a user's computer.

9. The method of claim 1, wherein the electronic document delivery system controls delivery of electronic documents to a user's handheld device.

10. The method of claim 1, wherein the delivery schedule is modifiable remotely by a user.

11. The method of claim 1, wherein the delivery schedule is set to allow delivery of electronic documents that require less than a specified memory allocation size and to suspend delivery of electronic documents that require greater than or equal storage space compared to the specified memory allocation size.

12. A method of controlling storage of electronic documents received for an electronic document delivery system, comprising the steps of:

setting at least one restriction on storing electronic documents received; and

automatically adapting, without user intervention, a scheme for storage of the electronic documents based on the at least one restriction.

13. The method of claim 12, wherein setting at least one restriction includes storing a suspension period during which electronic documents that are received are not stored.

14. The method of claim 12, wherein setting at least one restriction on storing electronic documents received includes, where a received electronic document is a recurring time basis publication, replacing, in memory, a previous publication of the received electronic document by the received electronic document each time a new publication of a received electronic document arrives so that a latest available publication of the electronic document is stored.

15. The method of claim 12, wherein setting at least one restriction on storing electronic documents received includes entering an instruction to suspend delivery indefinitely until re-establishment of delivery by a request by a user.

16. The method of claim 12, wherein setting at least one restriction on storing electronic documents received includes entering an entire delivery list for delivery suspension.

17. The method of claim 12, wherein setting at least one restriction on storing electronic documents received includes regulating storage of at least one electronically published document that is received.

18. The method of claim 12, wherein setting at least one restriction on storing electronic documents received includes regulating storage of at least one category of electronic mail that is received.

19. The method of claim 12, wherein the electronic document delivery system controls delivery of a plurality of electronic documents to a user's computer.

20. The method of claim 12, wherein the electronic document delivery system controls delivery of electronic documents to a user's handheld device.

21. The method of claim 12, wherein setting at least one restriction on storing electronic documents received includes is accomplished remotely by a user.

22. The method of claim 12, wherein setting at least one restriction on storing electronic documents received includes allowing delivery of electronic documents that require less than a specified memory allocation size and suspending delivery of electronic documents that require greater than or equal storage compared with the specified memory allocation size.

23. An apparatus for an electronic document delivery system that automatically suspends delivery of an electronic document, comprising:

a scheduling unit, for entering a delivery schedule for the electronic document into an electronic receiving device; and

a suspension control unit, coupled to the scheduling unit, for automatically suspending, without user intervention, delivery of the electronic document based on the delivery schedule in accordance with a predetermined suspension scheme.

24. The apparatus of claim 23, wherein the suspension control unit stores a delivery suspension period for the document.

25. The apparatus of claim 23, wherein the predetermined suspension scheme provides for, where the document is a recurring time basis publication, replacing the document by a later delivered document for the recurring time basis publication each time a new publication of the document arrives so that a latest available publication of the document is stored.

26. The apparatus of claim 23, wherein the predetermined suspension scheme provides for suspending delivery indefinitely until re-establishment of delivery when a request is made by a user.

27. The apparatus of claim 23, wherein the predetermined suspension scheme includes entry of an entire delivery list for delivery suspension.

28. The apparatus of claim 23, wherein the predetermined suspension scheme includes suspension of delivery of at least one electronically published document.

29. The apparatus of claim 23, wherein the predetermined suspension scheme includes suspension of delivery of electronic mail.

30. The apparatus of claim 23, wherein the predetermined suspension scheme controls delivery of electronic documents to a user's computer.

31. The apparatus of claim 23, wherein the predetermined suspension scheme controls delivery of electronic documents to a user's handheld device.

32. The apparatus of claim 23, wherein the predetermined suspension scheme is modifiable remotely by a user.

33. The apparatus of claim 23, wherein the predetermined suspension scheme is set to allow delivery of electronic documents that require less than a specified memory allocation size and to suspend delivery of electronic documents that require greater than or equal storage space compared to the specified memory allocation size.

34. An apparatus for an electronic document delivery system that controls storage of electronic documents received, comprising:

a delivery regulating unit that sets at least one restriction on storing electronic documents received; and

an electronic document storage unit, coupled to the delivery regulating unit, that automatically stores, without user intervention, the electronic documents received in accordance with the at least one restriction.

35. The apparatus of claim 34, wherein the at least one restriction provides for utilizing a suspension period during which electronic documents that are received are not stored.

36. The apparatus of claim 34, wherein the at least one restriction on storing electronic documents received includes, where a received electronic document is a recurring time basis publication, replacing, in memory, a previous publication of the received electronic document by the received electronic document each time a new publication of a received electronic document arrives so that a latest available publication of the electronic document is stored.

37. The apparatus of claim 34, wherein the at least one restriction on storing electronic documents received includes an instruction to suspend delivery indefinitely until re-establishment of delivery by a request by a user.

38. The apparatus of claim 34, wherein the at least one restriction on storing electronic documents received includes suspension for an entire delivery list.

39. The apparatus of claim 34, wherein the at least one restriction on storing electronic documents received includes storage regulation of at least one electronically published document that is received.

40. The apparatus of claim 34, wherein the at least one restriction on storing electronic documents received includes regulating storage of at least one category of electronic mail that is received.

41. The apparatus of claim 34, wherein the electronic receiving device is a user's computer.

42. The apparatus of claim 34, wherein the electronic receiving device is a user's handheld device.

43. The apparatus of claim 34, wherein the at least one restriction on storing electronic documents received is entered remotely by a user.

44. The apparatus of claim 34, wherein the at least one restriction on storing electronic documents received includes allowing delivery of electronic documents that require less than a specified memory allocation size and suspending delivery of electronic documents that require greater than or equal storage compared with the specified memory allocation size.

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